

**What is Claimed is:**

1. A method for fabricating a capacitor of a semiconductor device, comprising the steps of:

5 forming a storage electrode using silicon;

sequentially depositing a first  $\text{Al}_2\text{O}_3$  film, a  $\text{Ta}_2\text{O}_5$  layer doped with Ti, and a second  $\text{Al}_2\text{O}_3$  film on the storage electrode to form a dielectric film; and

10 forming a plate electrode on the dielectric film using metal.

2. The method according to claim 1, wherein the first  $\text{Al}_2\text{O}_3$  film and the second  $\text{Al}_2\text{O}_3$  film is formed in a LPCVD process, an ALD process or a PECVD process.

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3. The method according to claim 1, the first  $\text{Al}_2\text{O}_3$  film, the  $\text{Ta}_2\text{O}_5$  layer doped with Ti, and the second  $\text{Al}_2\text{O}_3$  film have a thickness ranging from 5 to  $100\text{\AA}$ , respectively.

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4. The method according to claim 1, wherein the  $\text{Ta}_2\text{O}_5$  layer doped with Ti is formed using a cocktail source containing 1 - 50% of a Ti source in an in-situ doping process.

5. The method according to claim 4, wherein the in-situ doping process is performed using a mixture of the cocktail source and O<sub>2</sub> gas.

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6. The method according to claim 1, wherein the Ta<sub>2</sub>O<sub>5</sub> layer doped with Ti is formed in an ALD process, an MOCVD process or a PECVD process.

10 7. A capacitor of a semiconductor device, comprising:

a storage electrode comprising silicon;

a dielectric film disposed on the storage electrode, the dielectric film including a stacked structure of a first Al<sub>2</sub>O<sub>3</sub> film, a Ta<sub>2</sub>O<sub>5</sub> layer doped with Ti, and a second Al<sub>2</sub>O<sub>3</sub> film; and

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a metal plate electrode disposed on the dielectric film.